<u>Remarks</u>

Reconsideration and allowance of the subject application are respectfully solicited.

Claims 1 and 3-8 remain pending in the application, with Claim 1 being independent. The specification and Claim 8 have been amended herein to improve their form. These changes have not been made for any reasons related to patentability and do not affect the scope of the invention.

Claims 1, 3 and 6-8 were rejected under 35 U.S.C. § 103 as unpatentable over Applicants' disclosure in Figs. 13 and 16 and the corresponding text at pages 6 to 10 of the present application in view of U.S. Patent No. 6,392,717 (<u>Kunzman</u>). Claims 4 and 5 were rejected under § 103 as unpatentable in further view of U.S. Patent No. 6,597,348 (<u>Yamazaki et al.</u>). These rejections are respectfully traversed.

As is recited in independent Claim 1, the present invention relates to a color liquid crystal display device including a liquid crystal display part, and light sources for irradiating the liquid crystal display part with lights of three primary colors, respectively, the device performing display of one frame by respective fields of three primary colors and a white field displayed with a mixture of the three primary colors in the liquid crystal display part. The device further includes a circuit for comparing brightness levels of inputted three primary color signals for a pixel to determine a minimum value, a circuit for determining a brightness level of a pixel in the white field as the minimum value modulated by a proportion value and for determining a maximum value of the minimum value of each pixel in one frame, a circuit for subtracting the brightness value of each pixel

in the white field from the inputted three primary color signals to create display signals for respective primary color fields, and a circuit for setting the brightness of the light source in the white field as the maximum value multiplied by the proportion value and for driving the light source while supplying the display signals of the respective fields of three primary colors and the white field.

Applicants' Figs. 13-16 depict a conventional liquid crystal display device including a minimum value detection circuit 14, R, G and B subtraction processing circuits 17-19, and a parallel/serial conversion circuit 20 having a frame memory 21, all for use with a liquid crystal display part 22 and a light source unit 23. However, as recognized by the Examiner, this conventional system does not include a circuit for determining a brightness level of a pixel in a white field as a minimum value modulated by a proportion value and for determining a maximum value of the minimum value of each pixel in one frame, and a circuit for setting the brightness of the light source in the white field as the maximum value multiplied by the proportion value and for driving the light source while supplying the display signals of the respective fields of three primary colors and the white field, as is recited in independent Claim 1.

Thus, the system of Applicants' Figs. 13-16 fails to disclose or suggest important features of the present invention recited in the independent claim.

Kunzman relates to a high brightness digital display system. As understood by Applicants, Kunzman arranges a white field (or white pixel) so as to increase the brightness of an image and determines a white signal from red, green and blue so as not to

generate wash-out of a high brightness region Kunzman teaches making a brightness signal of the white field from a minimum value W of RGB (i.e., min (R, G, B)).

When W exceeds a certain value Cmax, the signals actually applied to the pixel in Kunzman are signals having values obtained by adding certain values to the original RGB signals, respectively, and brightness as the amount of Cmax is compensated by lighting of the white field, whereby the brightness of an image can increase and the wash-out can be avoided in the level of high brightness. These values include the following:

$$R' = R+g(W-Cmax)$$

$$G' = G+g(W-Cmax)$$

$$B' = B+g(W-Cmax).$$

Applicants submit that Cmax is defined as the maximum value of each color. Although the contents of Cmax are not clear, Applicants believe that Cmax corresponds to the brightness level of the white field.

Accordingly, Applicants submit that Kunzman discloses a method of determining the brightness of each white pixel under the condition that the brightness of the light source is fixed. This is contrary to the present invention in which the brightness of the light source can be set, that is, the brightness of the light source can be modulated corresponding to an image.

Accordingly, although Kunzman may disclose determining the minimum value of RGB, the reference fails to disclose or suggest either determining a maximum value of a minimum value of each pixel in one frame, and setting the brightness of the light

source using the maximum value, as in the present invention. Although Kunzman can determine the signal level of each pixel, Kunzman can never modulate or set the brightness of the a light source corresponding to the brightness level of an image because the brightness of the light source in Kunzman is determined by the transmittance of a rotating wheel.

On page 3 of the Office Action at lines 3-6, it is suggested that Kunzman determines a maximum value (Cmax) of a minimum value of each pixel in one frame. However, Applicants submit that Kunzman does not disclose determining the maximum value in a frame. From the description at col. 4, lines 31-40:

> The signal Cmax is defined to be the maximum of any value of color.
>
> If ($W \geqq$ Cmax) then
>
> $$\begin{bmatrix} \mathbf{R'} \\ \mathbf{G'} \\ \mathbf{B'} \end{bmatrix} = \begin{bmatrix} \mathbf{R + g(W - Cmax)} \\ \mathbf{G + g(W - Cmax)} \\ \mathbf{B + g(W - Cmax)} \end{bmatrix}.$$

That is, Cmax is smaller than W (minimum value of RGB of each pixel) in some cases and therefore Cmax of Kunzman is not the maximum value (in a frame) of W.

In the Office Action at page 3, lines 6-10, it is suggested that Kunzman sets the brightness of the light source in the white field as the maximum value (Yws) multiplied by the proportion value (Yratio) and drives the light source while supplying the display signals of the respective fields of three primary colors and the white field. However, Fig. 6 and its corresponding text in Kunzman relates to calibration of the brightness of a light

source. The brightness is measured at 64 and on the basis of the result the parameters of the color wheel are determined. Since here Kunzman measures the brightness, Kunzman cannot determine the brightness of the light source from image data.

Thus, Kunzman fails to remedy the deficiencies of the conventional system noted above with respect to independent Claim 1.

Yamazaki et al. has also been reviewed but is not believed to be any more relevant than the citations noted above.

Thus, independent Claim 1 is patentable over the citations of record. Reconsideration and withdrawal of the § 103 rejections are respectfully requested.

For the foregoing reasons, Applicants respectfully submit that the present invention is patentably defined by independent Claim 1. Dependent Claims 3-8 are also allowable, in their own right, for defining features of the present invention in addition to those recited in their respective independent claims. Individual consideration of the dependent claims is requested.

Applicants submit that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action, and an early Notice of Allowability are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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